

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,377,261 B2
APPLICATION NO. : 10/568184
DATED : May 27, 2008
INVENTOR(S) : Y. Sukegawa et al.

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE CLAIMS

Column 33, line 28, through column 34, line 49, the claims should read:

29. A combustion control method ~~according to claim 28, further~~ of a spark ignition engine, comprising the steps of:

generating turbulence in an exhaust flow in an exhaust passage;

injecting fuel directly into a combustion chamber; and

injecting fuel in an expansion stroke in the case where a temperature of the engine is lower than a predetermined temperature.

~~setting a time interval between a latest fuel injection initiation timing and an ignition initiation timing to 9 ms or more.~~

30. A combustion control method ~~according to claim 26, further~~ of a spark ignition engine, comprising the steps of:

causing penetration of injected fuel spray in a direction of an ignition plug longer than that in a direction of a piston;

in the case where a temperature of the engine is lower than a predetermined temperature, injecting fuel in a second half of a compression stroke so that an air-fuel ratio is in a vicinity of a theoretical air-fuel ratio; and

causing ignition timing to occur immediately before a compression stroke top dead center or later.

~~injecting fuel into an intake port;~~

~~and in the case where the temperature of the engine is lower than the predetermined temperature, injecting fuel in an intake stroke.~~

31. A combustion control method of a spark ignition engine, comprising the steps of:

in the case where a temperature of the engine is lower than a predetermined temperature, generating a forward longitudinal vortex in a combustion chamber;

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IN THE CLAIMS

- injecting fuel in a second half of a compression stroke so that an air-fuel ratio is in a vicinity of a theoretical air-fuel ratio; and
causing ignition timing to occur immediately before a compression stroke top dead center or later.
~~generating turbulence in an exhaust flow in an exhaust passage;~~
~~injecting fuel directly into a combustion chamber; and~~
~~injecting fuel in an expansion stroke in the case where a temperature of the engine is lower than a predetermined temperature.~~
32. A combustion control method of a spark ignition engine, comprising the steps of:
causing penetration of injected fuel spray in a direction of an ignition plug longer than that in a direction of a piston;
in the case where a temperature of the engine is lower than a predetermined temperature, generating a forward longitudinal vortex in a combustion chamber;
injectings fuel in a second half of a compression stroke so that an air-fuel ratio is in a vicinity of a theoretical air-fuel ratio; and
causing ignition timing to occur immediately before a compression stroke top dead center or later.
33. A combustion control method ~~of a spark ignition engine~~ according to Claim 31, comprising the steps of:
regulating the strength of a forward longitudinal vortex generated in a combustion chamber so that a magnitude of a fluctuation of engine speed or torque fluctuation is a predetermined value or less; and
delaying ignition timing to an extent possible.
~~in the case where a temperature of the engine is lower than a predetermined temperature, generating a forward longitudinal vortex in a combustion chamber;~~
~~injecting fuel in a second half of a compression stroke so that an air-fuel ratio is in a vicinity of a theoretical air-fuel ratio; and~~
~~causing ignition timing to occur immediately before a compression stroke top dead center or later.~~

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IN THE CLAIMS

34. A combustion control method ~~according to claim 33 of a spark ignition engine,~~
comprising the steps of:

in the case where a temperature of the engine is lower than a predetermined
temperature, injecting fuel in a second half of a compression stroke so that
an air-fuel ratio is in a vicinity of a theoretical air-fuel ratio;
regulating an injection pressure of fuel so that a magnitude of a fluctuation of
engine speed or torque fluctuation is a predetermined value or less; and
delaying ignition timing to an extent possible.
~~-regulating the strength of a forward longitudinal vortex generated in a~~
~~combustion chamber so that a magnitude of a fluctuation of engine speed or torque~~
~~fluctuation is a predetermined value or less; and~~
~~-delaying ignition timing to an extent possible.~~

35. A combustion control method ~~of a spark ignition engine~~according to Claim 28,
further comprising the steps of:

setting a time interval between a latest fuel injection initiation timing and an
ignition initiation timing to 9 ms or more.
~~-causing penetration of injected fuel spray in a direction of an ignition plug~~
~~longer than that in the direction of a piston;~~
~~-in the case where a temperature of the engine is lower than a predetermined~~
~~temperature, generating a forward longitudinal vortex in a combustion chamber;~~
~~-injecting fuel in a second half of a compression stroke so that an air-fuel ratio~~
~~is in a vicinity of a theoretical air-fuel ratio; and~~
~~-causing ignition timing to occur immediately before or later than a~~
~~compression stroke top dead center.~~

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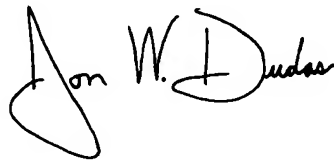
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE CLAIMS

36. A combustion control method ~~of a spark ignition engine, according to Claim 26,~~
further comprising the steps of:
 injecting fuel into an intake port; and
 in the case where the temperature of the engine is lower than the
 predetermined temperature, injecting fuel in an intake stroke.
~~a second half of a compression stroke so that an air fuel ratio is in a vicinity of a~~
~~theoretical air fuel ratio;~~
~~regulating an injection pressure of fuel so that a magnitude of a fluctuation of~~
~~engine speed or torque fluctuation is a predetermined value or less; and~~
~~delaying ignition timing to an extent possible.~~

Signed and Sealed this

Second Day of September, 2008



JON W. DUDAS
Director of the United States Patent and Trademark Office